In the Claims

1. (Previously Presented) A method for converting color images to textured monochrome images such that regions with similar luminance but different chrominance appear different when converted to black-and-white, comprising:

a) converting the color image to a luminance-chrominance color space;

b) performing a wavelet transformation of the luminance channel;

c) replacing a predetermined number of sub-bands by scaled versions of the chrominance channels; and

d) inverting the transformation to create a black-and-white image having artificial textures proportional to colors in the color image.

2. (Original) A method, as defined in claim 1, wherein the luminance-chrominance color space is either YCbCr or Lab.

3. (Original) A method, as defined in claim 1, further comprising mapping neutral colors to neutral wavelet coefficient values.

4. (Original) A method, as defined in claim 1, further comprising replacing colors that are significantly different with significantly different textures.

5. (Original) A method, as defined in claim 1, wherein the number of sub-bands replaced is minimally two, one for Cb and one for Cr.

6. (Original) A method, as defined in claim 1, further comprising incorporating a C plane into the image as an extra chrominance plane that can be used to replace yet another sub-band with C incorporating only positive (or negative) values of either Cb or Cr.

7. (Original) A method, as defined in claim 1, further comprising decomposing the chrominance into 4 channels having positive and negative values, such that: Cb+ = Cb u(Cb); Cb- = -Cb u(-Cb); Cr+ = Cr u(Cr); Cr- = -Cr u(-Cr).

8. (Original) A method, as defined in claim 1, further comprising decomposing the chrominance into any number of channels, from 1 to N-1, where N is the total number of sub-bands wherein the channels represent chrominance information in the original image.

9. (Original) A method, as defined in claim 1, further comprising, preserving the wavelet coefficients with the largest magnitude either coming from the wavelet transform or from the chrominance plane.

10. (Original) A method, as defined in claim 9, further comprising using the following for preserving said largest magnitude coefficients: new_wavelet(b,i,j) = max(old_wavelet(b,i,j), chrominance(i,j)).

11. (Previously Presented) A method for recovering a color image from a black-and-white image embedded with chrominance information reproduced from the color image, comprising:

a) obtaining electronic image data of the black-and-white image embedded with chrominance information applying a first transformation to the electronic image data;

b) calculating wavelets from the first transformed data;

c) recovering chrominance information from the calculated wavelets;

d) recovering luminance information from the calculated wavelets; and

e) combining the recovered chrominance and luminance information to create a color image corresponding to the black-and-white image embedded with chrominance information.

12. (Original) A method, as in claim 11, wherein the encoded chrominance information comprises a plurality of wavelet sub-bands.

13. (Original) A method, as in claim 11, wherein the encoded chrominance information comprises positive and negative values of Cr and positive and negative values of Cb.

14. (Original) A method, as in claim 11, wherein the applied first transformation comprises a distortion-correcting affine transform.

15. (Original) A method, as in claim 11, wherein the recovering of chrominance information comprises recombining positive and negative values of Cb and positive and negative values of Cr.

16. (Original) A method, as in claim 12, wherein the recovering of luminance information comprises zeroing all chrominance-loaded wavelet sub-bands.

17. (Original) A method, as in claim 11, wherein the first transformation comprises sharpening the image before calculating wavelets therefrom to account for printing and scanning resolution, degradation, and defects.

18. (Original) A method, as in claim 11, wherein the recovering of luminance information and chrominance information comprises an inverse transformation thereof.

19. (Original) A method, as in claim 11, further comprising a post-processing transformation of the color image.

20. (Original) A method, as in claim 19, wherein the transformation comprises increasing the saturation of said color image.

21. (Original) A method, as in claim 19, wherein the transformation comprises applying a sharpening filter to said recovered luminance information to counteract any loss of sharpness.

22. (Original) A method, as in claim 19, wherein the transformation comprises applying a noise-reducing filter to said recovered chrominance to reduce noise introduced by the reconstruction of the color image.

23. (Previously Presented) A system for recovering a color image from a black-and-white image reproduced from the color image, comprising:

a processor; and

a scanner for obtaining electronic image data of the black-and-white image;

said processor applying a first transformation to the electronic image data;

said processor calculating wavelets from the first transfomed data;

said processor recovering chrominance information from the calculated wavelets;

said processor recovering luminance information from the calculated wavelets;

said processor combining the recovered chrominance and luminance information to create a color image corresponding to the black-and-white image embedded with chrominance information.

24. (Original) A system, as in claim 23, wherein the encoded chrominance information comprises a plurality of wavelet sub-bands.

25. (Original) A system, as in claim 23, wherein the encoded chrominance information comprises positive and negative values of Cr and positive and negative values of Cb.

26. (Original) A system, as in claim 23, wherein the applied first transformation comprises a distortion-correcting affine transform.

27. (Original) A system, as in claim 23, wherein the recovering of chrominance information comprises recombining positive and negative values of Cb and positive and negative values of Cr.

28. (Original) A system, as in claim 27, wherein the recovering of luminance information comprises zeroing all loaded wavelet sub-bands.

29. (Original) A system, as in claim 28, wherein the first transformation comprises sharpening the image before calculating wavelets therefrom to account for printing and scanning resolution, degradation, and defects.

30. (Original) A system, as in claim 28, wherein the recovering of luminance information and chrominance information comprises an inverse transformation thereof.

31. (Original) A system, as in claim 28, further comprising a post-processing transformation of the color image.

32. (Original) A system, as in claim 31, wherein the transformation comprises increasing the saturation of said color image.

33. (Original) A system, as in claim 31, wherein the transformation comprises applying a sharpening filter to said recovered luminance information to counteract any loss of sharpness.

34. (Original) A system, as in claim 31, wherein the transformation comprises applying a noise-reducing filter to said recovered chrominance to reduce noise introduced by the reconstruction of the color image.